

GALLAGHER

Serial No. 09/744,818

Amendment After Final Rejection dated December 23, 2003

Reply to Office Action dated October 3, 2003

**Amendments to the Claims:**

This listing of claims will replace all prior versions and listings of claims in the application. By the present amendment, claims 11 and 16-20 have been canceled without prejudice or disclaimer as to the subject matter contained therein.

**Listing of Claims:**

Claims 1-11 (Canceled).

Claim 12. (*Previously Presented*)            A sensor, comprising:

                 a mechanical resonator comprising two beams, a yoke rigidly connecting said beams at a first location so that said beams are mutually clamped at said first location, and a connecting element connecting the beams at a second location spaced from the first location along the beams, said connecting element having a stiffness that at least partially determines a modal shape of resonant vibration of the beams; and

                 at least one transducer, disposed adjacent one of the beams at a location between said first and second locations, and being disposed to sense a vibrational parameter that indicates a variation of said modal shape.

Claim 13. (*Previously Presented*)            A sensor as set forth in claim 12, wherein said connecting element provides a clamped connection of said beams at said second location, and wherein said at least one transducer senses a variation of said modal shape from a clamped-clamped shape to a clamped-pinned shape.

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Claim 14. (*Previously Presented*)            A sensor as set forth in claim 12, wherein said connecting element provides a pinned connection between said beams at said second location, and wherein said at least one transducer senses a variation of the modal shape from a clamped-pinned condition to a clamped-free condition.

Claim 15. (*Previously Presented*)            A sensor, comprising:

- a mechanical resonator comprising two parallel beams;
- a yoke connecting said beams together at a first discrete location;
- a box section connecting said beams together at a second discrete location spaced apart from said first discrete location, said box section including first and second spaced connecting elements which connect the beams together, said connecting elements having stiffnesses that at least partly determine a modal shape of resonant vibration of the resonator; and

at least one transducer disposed between the first and second locations to measure a vibrational parameter that indicates variation of said modal shape.

Claims 16-20. (*Canceled*).

Claim 21. (*Previously Presented*)            A method of sensing, comprising:

deploying a sensor comprising a mechanical resonator comprising two parallel beams and at least two connecting elements which connect the beams together at

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different, spaced-apart, locations, at least one of said connecting elements having a stiffness which determines a modal shape of resonant vibration of the resonator, and at least one transducer disposed to provide a vibrational parameter which indicates a variation of said modal shape;

exposing one of said connecting elements to an environment which physically alters one of said connecting elements so as to alter its stiffness; and monitoring a change in said modal shape.